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Six hundred and thirty-eighth Meeting.

December 12, 1871. — ADJOURNED STATED MEETING.

The PRESIDENT in the chair.

The Corresponding Secretary read letters from Messrs. Henry G. Denny, John Trowbridge, and John K. Paine, acknowledging their election into the Academy, and he announced that Part First, of Vol. X. of the Memoirs of the Academy, containing Professor Joseph Lovering's *Memoirs on the Periodicity of the Aurora*, was now ready for distribution.

The President called the attention of the Academy to the recent decease of Mr. J. G. Cogswell, the oldest Resident Fellow, with one exception, of the Academy.

The Chairman of the Rumford Committee announced that the medal awarded to Mr. Joseph Harrison, Jr., was ready for presentation, and it was voted, — That this medal be presented at the monthly meeting in January.

The following gentlemen were elected into the Academy: —

R. W. Hooper, of Boston, to be a Resident Fellow in Class II., Section 4.

J. B. Pettee, of Cambridge, to be a Resident Fellow in Class II., Section 1.

S. P. Sharples, of Cambridge, to be a Resident Fellow in Class I., Section 3.

G. R. Baldwin, of Quebec, to be a Resident Fellow in Class I., Section 4.

Professor A. P. Rockwell exhibited some fragments of the tusk of a mastodon, discovered by Captain Bethune about four miles from Golden City.

Professor N. S. Shaler made a communication supplementary to that presented by Mr. Wright, at a previous meeting, on Phyllotaxis. He showed that the parts of some of the highest polyps are arranged like the leaves of plants. Polyps may be divided into two groups: first, those which are nearly flat, forming a level sheet; and, secondly, those grouped along a stem. In the latter the different individuals are arranged often in spirals.

The fraction for the *Oculina* is about one fifth, for the *Madrepore* a higher ratio, while for the *Carnapsammia* it is less than one third.

Professor Benjamin Peirce made a communication on the mean motions of the four outer planets. After referring to the curious relation noticed by Laplace, that the mean motion of Jupiter is very nearly five times that of Saturn, and to his own observation, that the mean motion of Uranus is about twice that of Neptune, he proceeded to show the following new relation between these mean motions: — $3n_7 + 8n_8 - n_5 = o$. $4n_6 - 16n_7 + 9n_8 = o$, and $2n_5 - 12n_6 + 17n_8 + 6n_9 = o$. Laplace has shown that if such relations are approximately true they must, in time, become accurately so; and hence these equations afford an excellent means of computing the mean motions of Saturn, Uranus, and Neptune, assuming that of Jupiter. The results are for Saturn, 44.001.805 sec., for Uranus, 15.428.182 sec., and for Neptune, 7.871.511 sec., which agree very nearly with observation.

Mr. William Everett proposed —

A new reading in Virgil, Æneid, Book I. Line 445.

The reading of all the MSS. here is: — Egregiam, et facilem VICTU per saecula gentem. The interpretations of the word *Victu* here are various. Some commentators venturing to take it from *vincere*, and using it actively, so that *facilem victu* = *victoriâ pollentem*. Most, however, take it as a latter supine from *vivo*, or ablative singular from *victus*, and make *facilem victu* = *facilem victum habituram*. This view is best stated by Heyne, *Excursus ad locum*, who compares, but, in my opinion, inaptly, Georg. II. 460, Æn. VIII. 318. His statement has satisfied later commentators. Weidmann (Commentar zu Virgil's Æneis, B. I. und II. Leipzig, 1869) has summed up all the learning that can be advanced on it.

I confess that, after all possible parallels have been adduced, I cannot find either a symbol of fertility or wealth in a war-horse; nor can I think *facilem victu* a natural expression in the sense given it. I therefore propose to read Facilem VECTU — the *E* and *I* in the best uncial MSS. differing exceedingly little from each other.

Thus we shall have Virgil's very favorite word *vehor*, I *move*, or *am* *transported*, so appropriate to the Carthaginian navigators who monopolized the *carrying trade* of the ancient world. This quality is symbolized by the horse, the type of transportation all over the world, and chosen by all poets as the emblem of the sea, from Homer in the Fourteenth Book of the Iliad to Byron in the finale to Childe Harold.

This emendation was suggested to me many years ago by my late revered father.

Six hundred and thirty-ninth Meeting.

January 9, 1872. — MONTHLY MEETING.

The CORRESPONDING SECRETARY in the chair.

Professor J. P. Cooke read the following statement by the Rumford Committee of the grounds on which the Rumford Medal was awarded to Joseph Harrison, Jr., of Philadelphia, by vote of the Academy passed May 30, 1871. This statement was adopted by the Committee at a full meeting held December 23, 1871.

An award of the Rumford Medal was made at the annual meeting of the Academy, May 30, 1871, in the following terms: — "Voted, that the Rumford Medal be awarded to Joseph Harrison, Jr., of Philadelphia, for his mode of constructing steam-boilers, by which great safety has been secured."

The "Harrison Boiler" consists of a number of hollow cast-iron spheres, about eight inches in external diameter, and three eighths of an inch thick. These spheres are cast in groups of two or four, the spheres of each group being arranged in straight lines, and connected with each other by curved necks about three and one quarter inches in diameter. Moreover, each sphere has two half-necks, which make openings at right angles to the necks previously mentioned. The open necks are rabbeted, so that any number of the groups of spheres (units, as they are called) may be united to each other, and the system thus built up is held together by wrought-iron tie-bolts, which pass through each line of spheres in the direction of the half or jointed necks, connecting at each end with caps that close the external orifices of the end spheres on each line. The castings are made with such uniformity, and the necks turned so as to fit each other with such accuracy, that when the rabbeted edges are adjusted and drawn together by the screw